

### Oral Exercises

Express in exponential form.

1.  $\log_2 32 = 5$

2.  $\log_3 9 = 2$

3.  $\log_7 \sqrt{7} = \frac{1}{2}$

4.  $\log_3 \frac{1}{81} = -4$

Express in logarithmic form.

5.  $4^3 = 64$

6.  $9^{3/2} = 27$

7.  $10^{-2} = 0.01$

8.  $16^{-3/4} = \frac{1}{8}$

Simplify.

9.  $\log_6 36$

10.  $\log_2 16$

11.  $\log_{10} 100$

12.  $\log_3 \frac{1}{9}$

13.  $\log_2 2\sqrt{2}$

14.  $\log_7 1$

15.  $4^{\log_4 16}$

16.  $\log_6 (6^5)$

### Written Exercises

Simplify each logarithm.

**A** 1.  $\log_5 125$

2.  $\log_4 16$

3.  $\log_3 81$

4.  $\log_6 6$

5.  $\log_3 1$

6.  $\log_8 4$

7.  $\log_5 \frac{1}{25}$

8.  $\log_2 \frac{1}{8}$

9.  $\log_6 6\sqrt{6}$

10.  $\log_5 25\sqrt{5}$

11.  $\log_4 \sqrt{2}$

12.  $\log_{27} \sqrt{3}$

13.  $\log_7 \sqrt[3]{49}$

14.  $\log_3 \sqrt[5]{9}$

15.  $\log_{1/2} 8$

16.  $\log_{1/3} 27$

17.  $\log_2 \sqrt[3]{\frac{1}{4}}$

18.  $\log_{10} \frac{1}{\sqrt{1000}}$

Solve for  $x$ .

19.  $\log_7 x = 2$

20.  $\log_6 x = 3$

21.  $\log_9 x = -\frac{1}{2}$

22.  $\log_6 x = 2.5$

23.  $\log_4 x = -\frac{3}{2}$

24.  $\log_{1/9} x = -\frac{1}{2}$

**B** 25.  $\log_x 27 = \frac{3}{2}$

26.  $\log_x 64 = 6$

27.  $\log_x 7 = -\frac{1}{2}$

28.  $\log_x 7 = 1$

29.  $\log_x 1 = 0$

30.  $\log_x 2 = 0$